A SYNTHETIC MILK MEDIUM

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Natural milk, which has long been used as a medium for bacteriological growth, presents many points which detract greatly from its value in exact determinations.

For several years there has been used in this laboratory an artificial milk as a substitute for natural milk. This medium* consists of a solution of nutrose and lactose in distilled water. It has many advantages over the natural milk. It does, however, present certain disadvantages, in that nutrose is a more or less proprietary article, the exact composition of which is not generally known. It is said to be a sodium-phosphate-casein. In order to obviate this difficulty, experiments have been undertaken with definite solutions of caseinogen dissolved in distilled water, to which is added sodium hydrate, calcium chloride, and a certain amount of lactose. Varying amounts of each of the ingredients have been tried and the following method of preparation has been found to give a very satisfactory medium: Fifteen grams of pure caseinogen are dissolved in 100 c.c. of a 1 per cent. solution of sodium hydroxide in distilled water. Eighteen to 24 hours may be required for a complete solution. After the caseinogen is dissolved the solution is diluted to about 900 c.c. with distilled water. Ten grams of lactose and 0.1 grams of calcium chloride are added and the solution made up to 1,000 c.c. with distilled water. It is then neutralized and made + 0.3 with N/1 HCl, using phenolphthalein as an indicator. This medium is sterilized in an autoclave at a 107 degrees for 20 minutes. The finished product should be a clear, transparent solution. When the medium has a reaction of +0.3 about 24 hours are usually required for coagulation with an active strain of B. coli. When the reaction is neutral a somewhat longer time may be required to produce similar results. This medium has been thoroughly tested on the routine test for B. coli and apparently meets all requirements. It has several advantages over artificial milk previously described, *viz.*:—

1. It is easy to prepare.
2. It has definite composition.
3. Its transparency makes it easily possible to distinguish between precipitation and coagulation.
4. The materials required for its manufacture can be kept constantly on hand.

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